Sandia National Laboratories

TOPCAT™ for the Alignment & Concentration of Solar Troughs

Summary

This technology is a new technique for parabolic trough mirror alignment based on the use of an innovative Theoretical Overlay Photographic (TOP) approach. It is a variation of current methods used on parabolic dish systems and involves overlay of theoretical images of the Heat Collection Element (HCE) in the mirrors onto carefully surveyed photographic images and adjustment of mirror alignment until they match. The TOP approach promises to be practical, straightforward, and inherently aligns the mirrors to the HCE. Alignment uncertainty with this technique is predicted to be less than the mirror slope error.

Additionally, a module-to-module alignment method is used to align multiple solar trough concentrators to provide superior optical performance. Any module-to-module misalignment can be corrected by adding the necessary relative module adjustment to the TOP alignment of the module mirrors.

BENEFITS

- Simple, easy to implement tools
- Increased efficiency & power
- Environmentally friendly
- Renewable resource
- Reduced cost
- Increased accuracy of trough alignment

APPLICATIONS

- Clean energy production
- Electric utility
- Alternative energy options

U.S. PATENTS ISSUED:

- 7,667,833

INTELLECTUAL PROPERTY & LICENSING CONTACT

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Technology Readiness Level:

Sandia estimates this technology with a TRL 5. It has been demonstrated that the key elements of this technology have been integrated with reasonably realistic supporting elements so technology can be tested in a simulated and operational environment.

Licensing & Partnering Status:

Various license and partnering options are available. Please contact the Intellectual Property department to discuss.

National Nuclear Security Administration

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